Foodborne Illness Information

from the Working Group on Foodborne Illness Control

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Monthly Statistics

Number of Complaints of Foodborne Illness Received by the Working Group on Foodborne Illness Control (Confirmed and Unconfirmed)

Month	Single Reports (one person ill)		Multiple (two or more people ill)	
	2003	Average (1997-2002)	2003	Average (1997-2002)
January	21	17	14	12
February	17	18	10	13
March	10	21	6	14
April	19	20	4	11
May	17	22	16	12
June	30	21	12	8
July	8	19	12	11
August	28	28	16	13

Laboratory Confirmed Cases Reported to the Division of Epidemiology and Immunization.

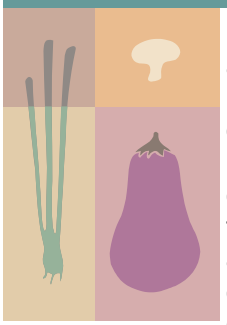
Month	*Campylobacter*		*Salmonella*		Shiga-toxigenic *E. coli*	
	2003	Ave. (1997-2002)	2003	Ave. (1997-2002)	2003	Ave. (1997-2002)
January	74	70	54	67	2	5
February	54	65	43	65	0	4
March	58	82	60	76	0	5
April	59	89	52	89	2	7
May	86	117	95	102	5	12
June	84	161	95	138	4	18
July	34	156	146	158	5	28
August	29	127	120	175	3	24

What's New in Foodborne Illness: Outbreaks and Information

Outbreak of *Salmonella* Hadar Linked to a Single Establishment in Southeastern Massachusetts: October 2002

Foodborne illness outbreaks are typically recognized when several people get ill soon after sharing a meal at an event such as a church picnic, wedding or other party. Public health officials usually learn about these outbreaks when one of the patrons realizes several in their party are ill and calls the health department. This is an effective method for detecting outbreaks when the common meal is obvious. However, not all outbreaks are detected in this fashion. Increasingly, outbreaks are first being discovered based on laboratory results.

In Massachusetts, when clinical laboratories confirm the diagnosis of certain infectious agents, they are required to report their results to the Massachusetts Department of Public Health (MDPH). For some pathogens, such as *Salmonella* species, the clinical laboratories also send the actual pathogen that they isolated to the Enteric Laboratory at the State Laboratory Institute (SLI) for further characterization. Staff from the Division of



Epidemiology and Immunization (EPI) and the laboratories review all the data in order to see if any diseases are occurring in unusual numbers or locations. If such a cluster of disease is detected, EPI will begin an investigation to try to determine if the cluster is in fact an outbreak that can be traced to a common exposure. MDPH investigated one such outbreak in southeastern Massachusetts in October of 2002.

On September 13, 2002, EPI was notified by the Enteric Laboratory at SLI of a cluster of three confirmed cases of *Salmonella* Hadar in residents of towns in southeastern Massachusetts. Since only one or two cases of *Salmonella* Hadar are typically reported each month, three cases could indicate an outbreak. EPI began an investigation to look for common exposures among the cases. When one of the cases was identified as a bartender at a local restaurant, the local health department in the town where the restaurant was located excluded the bartender from work until he submitted the required negative stool sample.

Over the next two weeks, the Enteric Laboratory received nine additional isolates of *S.* Hadar from residents of southeastern Massachusetts. EPI worked with local health departments to interview the cases to determine symptoms, onset dates, food histories and other potentially significant exposures. By September 27th, it was clear that many of the cases had eaten at that same restaurant where the positive bartender had worked. The cases reported eating different foods on various days since August 24th . They reported that symptoms began from 1 to 6 days after eating there. The predominant symptoms were diarrhea, abdominal cramps and fever. Nausea, vomiting, headache muscle aches and fatigue occurred to a lesser extent. Several people were hospitalized.

On September 27th, the Division of Food and Drugs contacted the local health department in the town where the suspect establishment was located. Because of the wide ranges of exposure and onset dates and the presence of a bartender who tested positive, it was strongly suspected that food workers were the source of the sporadic illnesses among patrons. In order to prevent further illness among patrons, all of the employees were excluded from work until they produced at least one negative stool sample, and submitted a second for testing. This effectively closed the restaurant on September 28th since the management was unable to get enough replacement workers to operate the establishment.

The local board of health oversaw the closing of the establishment and the collection and submission of stool samples from the employees. In addition, the manager was told to discard all open ready-to-eat foods and to thoroughly clean and sanitize all food contact surfaces. The management of the establishment was cooperative and agreed to comply with the requirements of the local health department and MDPH.

On October 2nd , the local health department conducted an inspection of the establishment while it was still closed. The inspector verified that the establishment was in good sanitary condition and that ready-to-eat foods had been discarded. The management had hired a professional cleaning service and had all the refrigerators and freezers checked to make sure they were functioning properly. However, in discussions with the management and some of the employees, it became evident that they were unaware of the importance of not working when ill with gastrointestinal symptoms. The manager was also unaware of his duty to ensure that the employees know to report specific symptoms and diseases to the person-in-charge.

Sixty-six full and part time employees were tested for bacterial enteric pathogens. Three food employees, in addition to the bartender, were positive for *S.* Hadar. A fifth was positive for *Salmonella* Adelaide. All of these employees, except the bartender, denied having symptoms of gastrointestinal illness in the recent past. None were allowed to return to work until they submitted two negative stool samples.

By October 3rd, enough food employees had tested negative to allow the establishment to re-open. The collection of second stool samples continued.

Approximately one month later, however, MDPH received reports of five additional cases of *S.* Hadar in patrons of this establishment. These cases had eaten at the restaurant on various days between October 4th and 31st. Again, because of the multiple dates of exposure, it was strongly suspected that one or more food employees were still shedding *Salmonella* and contaminating the food. The establishment again voluntarily

closed, and the employees were asked to submit additional stool samples.

This time around, two additional employees tested positive for *S.* Hadar, and another who had tested positive for *S.* Hadar the first time was now positive for *S.* Adelaide.

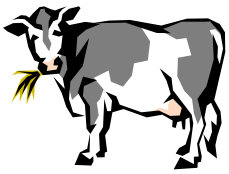
Initially, the management of this establishment decided to close for a month, but eventually they decided to close permanently. This closing made it exceedingly difficult to collect the rest of the stool samples. Forty-four employees did submit at least one stool sample. A letter and an enteric kit were mailed directly to the employees that hadn't submitted the required stool samples, but only two returned samples. Letters were also sent to local health departments in the towns in which these employees lived. The letters requested that the health agent contact the employees to ascertain whether they were still working in food service. If they were working in food service, they would be required to submit stool samples. Employees either could not be reached or reported no longer working in food service. There was no further attempt to obtain stool samples.

The *Salmonella* Hadar isolates from the patrons and the food employees were further characterized using pulsed-field gel electrophoresis (PFGE), commonly known as DNA fingerprinting. All of the isolates had PFGE patterns that were indistinguishable, which meant that a common source was likely and that the illnesses in the patrons were probably connected to the infected employees.

No common single food item was identified among the patrons who became ill, which supports the theory that infected food employees contaminated food served to the patrons over a prolonged period of time. Infected food workers can contaminate food if they fail to wash their hands thoroughly after using the bathroom and then prepare food without using gloves or utensils. Since *Salmonella* is killed by standard cooking temperatures, ready-to-eat foods are the most likely vehicles for this type of transmission, although contaminated food that is improperly cooked could also be a vehicle in this type of outbreak.

It is not clear how the food employees became infected with *Salmonella.* It is possible that these workers became infected after consuming a common contaminated meal at work, or it may have started with an infection in one employee that spread to others through person-to-person contact and/or by preparing food for each other.

As in this outbreak, it is not always obvious when food workers are infected with pathogens. There was no obvious illness or excessive absenteeism among the workers at this establishment. Therefore, it is very important that employees understand the importance of reporting symptoms of gastrointestinal illness to the person-in-charge. The person-in-charge and the manager must understand the importance of preventing ill employees from working and should make it possible for employees to report illness without fear of negative consequences. Finally, the person-in-charge should continually encourage the staff to practice good personal hygiene and to avoid bare-hand contact with ready-to-eat foods.



A Review: Shiga Toxin-producing *E. coli*

Shiga toxin-producing *E. coli* (STEC) have emerged as a significant problem across the United States, including Massachusetts. According to the Centers for Disease Control and Prevention (CDC), one STEC, *E. coli* O157:H7, causes an estimated 73,000 illnesses annually.

The incubation period for illness due to *E. coli* O157:H7 ranges from 2-8 days, with an average of 3-4 days. Symptoms include abdominal cramps, diarrhea, bloody diarrhea, nausea and vomiting, but infected individuals can also be asymptomatic. The infectious dose is low (<100 organisms), facilitating person-to-person transmission. Cattle and deer have been identified as reservoirs.

Ground beef is often implicated in *E. coli* O157:H7 outbreaks. In addition, other food items that have been identified as vehicles include deer meat, unpasteurized milk, unpasteurized apple cider and juice, alfalfa sprouts, radish sprouts, lettuce, potatoes and cantaloupe. Waterborne outbreaks of *E. coli* O157:H7 have also occurred as the result of drinking or swimming in contaminated, unchlorinated water.

Between 1997 and 2002, an average of 138 cases of *E. coli* O157 were reported in Massachusetts annually (Figure 1). The majority of the cases were among children under 20 years of age (Figure 2). As expected, there was a consistent increase in cases

during the spring and summer months.

Non-O157 STEC are also important pathogens, and are identified as the cause of outbreaks each year in the United States. The State Laboratory Institute (SLI) has identified an increase in non-O157 isolates over the last few years. This is most likely due to an increase in the availability of testing and typing of isolates. As of February 14, 2003, evidence of infection due to Shiga toxin-producing organisms is reportable by clinical laboratories (105 CMR 300.170) to the Massachusetts Department of Public Health (MDPH).

About 10 to 15 percent of children infected with *E. coli* O157:H7 develop hemolytic uremic syndrome (HUS), a serious condition which can be fatal.[1] HUS is characterized by the sudden rapid destruction of red blood cells, causing acute renal failure due partly to the impairment of small arteries in the kidneys. During the 5th year of national HUS reporting to the CDC, the median age of patients diagnosed with HUS was 4 years.[2] In 2000, MDPH established an active surveillance system to improve reporting of HUS. Active surveillance is the collection of disease-related information that places the burden of information collection on the investigator, in this case, MDPH. MDPH epidemiologists now contact Massachusetts-based pediatric nephrologists every two weeks and inquire about HUS cases newly identified. In 2002, there were 16 confirmed cases of HUS reported to MDPH (Figure 3). The median age of patients in Massachusetts diagnosed with HUS was 5 years, and the age range was 1 to 73 years. All the cases survived.

While most *E. coli* O157:H7 cases in Massachusetts are sporadic, there have been two significant *E. coli* O157:H7 outbreaks in the past 12 years. In Fall 1991, 23 cases of *E. coli* O157:H7 were identified in southeastern Massachusetts. Four of these cases were diagnosed with HUS. A case-control study implicated fresh-pressed, unpreserved apple cider as the vehicle. At the implicated cider mill, a large percentage of apples used to make the cider were "drops" (apples collected from the ground). The apples were not washed and brushed prior to processing. In addition, the cider-press operator raised cattle on his property.

In the summer of 1995, nine confirmed primary cases of *E. coli* O157:H7 were identified among patrons of a Mexican food concession stand at the Barnstable County Fair. A case-control study implicated beef-containing Mexican food from the concession stand. A hazard analysis critical control point (HACCP)

Figure 1. O157 STEC Cases, Massachusetts 1997-2002

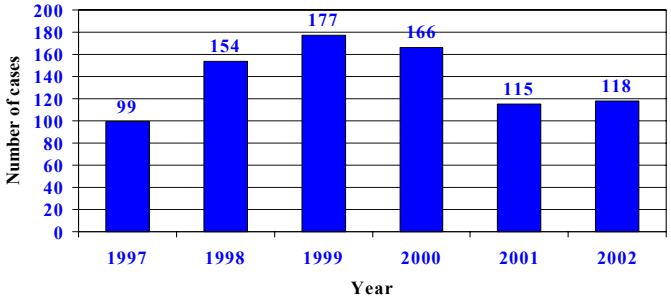


Figure 2. O157 STEC Cases by Age Group, Massachusetts 1997-2002

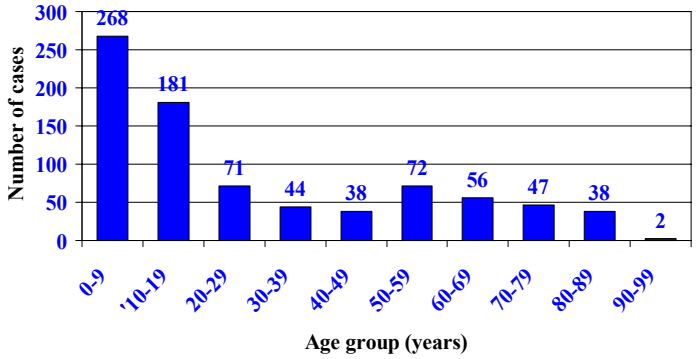
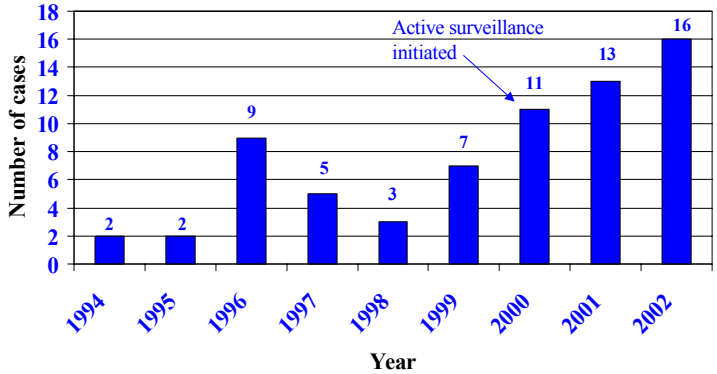


Figure 3. Confirmed HUS Cases Reported in Massachusetts, 1994-2002*



*Includes 25 cases from retrospective case review at Children's Hospital

evaluation of taco preparation at the concession stand revealed several high risk factors, including the partial cooking of large batches of ground beef and subsequent reheating of the beef without temperature monitoring. Partially cooked ground beef was also cooled improperly in a non-commercial refrigerator and refrigerated next to raw ground beef.

[1]Sawyer L. Prevention of hemolytic uremic syndrome (HUS) caused by infection with shiga toxin-producing Escherichia coli (STEC) with monoclonal antibody therapy, NIAID Presentation, Bethesda, MD, June 19, 2002.
[2]Centers for Disease Control and Prevention. Hemolytic uremic syndrome, postdiarrheal, MMWR 2002; 49: xiii.

Food Safety Web Links: Highlights of the Month

US Department of Agriculture: Food Safety Inspection Service
http://www.fsis.usda.gov/index.htm
This site contains everything you ever wanted to know about meat and poultry products. It also has a wealth of information about HACCP, including some sample plans. The site also has good information on food safety for the general public.

Safety Alerts
http://www.safetyalerts.com
If you are wondering whether a product has been recalled, this is the site for you. It contains information on all product recalls including food. It is up to date and easy to use.

Microbiological Standards and Guidelines
http://peaches.nal.usda.gov/foodborne/fbindex/Micro_Guidelines.asp
This site contains links to documents and websites from around the world that provide information on microbiological standards and guidelines for various foods.

And just for fun…….

http://foodsafe.ucdavis.edu/music.html
Go to this site to listen to fun food safety music. Professor Carl Winters from UC Davis has parodied popular songs making them into funny songs about food safety.